

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT: Barclay et al.

EXPRESS MAIL LABEL NO.: ET755553453US

FILED: HEREWITH

FOR: NOVEL POLYMERS AND PHOTORESIST COMPOSITIONS

THE HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS  
WASHINGTON, DC 20231

SIR:

**PRELIMINARY AMENDMENT**

Applicants file the above-identified application herewith. Please amend the application as follows.

**IN THE SPECIFICATION**

At page 1, line 1 of text, please add the following sentence:

--The present application claims the benefit of U.s. provisional application number 60/271,402, filed February 25, 2001, which is incorporated herein by reference in its entirety.--

**IN THE CLAIMS**

Please cancel without prejudice claims 21-23 and 26-40.

Please amend the following claims.

3. (amended) A photoresist composition of claim 1 wherein the polymer comprises photoacid-labile groups.

4. (amended) A photoresist composition of claim 1 wherein polymer further

6. (amended) The photoresist composition of claim 5 wherein the carbon alicyclic group comprises a photoacid-labile group.<sup>4</sup>

7. (amended) A photoresist composition of claim 1 wherein the polymer comprises a heteroalicyclic group in addition to the carbonate or lactone.

9. (amended) The photoresist composition of claim 8 wherein the additional heteroalicyclic group has a non-hydrogen ring substituent.

10. (amended) The photoresist composition of claim 1 wherein the polymer comprises a photoacid-labile group that is a substituent of an additional heteroalicyclic polymer group or a carbon alicyclic polymer group.

11. (amended) The photoresist composition of claim 1 wherein the polymer comprises a photoacid-labile moiety of a polymer unit separate a carbonate, lactone or carbon alicyclic unit.

12. (amended) The photoresist composition of claim 1 wherein the polymer comprises a polymerized acrylate that comprises a photoacid-labile moiety.

13. (amended) The photoresist composition of claim 1 wherein the polymer further comprises anhydride units.

14. (amended) The photoresist composition of claim 1 wherein the polymer further comprises maleic anhydride units.

15. (amended) The photoresist composition of claim 1 wherein the polymer is a terpolymer.

16. The photoresist composition of claim 1 wherein the polymer is a tetrapolymer or a pentapolymer.

17. (amended) The photoresist composition of claim 1 wherein the polymer is substantially free of aromatic groups.

18. (amended) The photoresist composition of claim 1 wherein the photoactive component comprises one or more photoacid generator compounds.

19. (amended) The photoresist composition of claim 1 wherein the photoresist is a chemically-amplified positive-acting resist.

20. (amended) A method of forming a positive photoresist relief image, comprising:


- (a) applying a coating layer of a photoresist of claim 1 on a substrate; and
- (b) exposing and developing the photoresist layer to yield a relief image.

24. (amended) An article of manufacture comprising a microelectronic wafer substrate or flat panel display substrate having coated thereon a layer of the photoresist composition of claim 1.

#### REMARKS

The specification has been amended to include the priority claim. For the sole purpose of reducing initial filing fees, claims 21-23 and 26-40 have been cancelled without prejudice, and claims 3, 4, 6, 7, 9-20 and 24 have been amended to eliminate multiple dependencies.

Early consideration and allowance of the application are solicited.

  
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**VERSION WITH CHANGES MARKED**

3. (amended) A photoresist composition of claim 1 [or 2] wherein the polymer comprises photoacid-labile groups.
4. (amended) A photoresist composition of claim 1 [any one of claims 1 through 3] wherein polymer further comprises a carbon alicyclic group fused to the polymer backbone.
6. (amended) The photoresist composition of claim [4 or] 5 wherein the carbon alicyclic group comprises a photoacid-labile group.<sup>4</sup>
7. (amended) A photoresist composition of claim 1 [any one of claims 1 through 6] wherein the polymer comprises a heteroalicyclic group in addition to the carbonate or lactone.
9. (amended) The photoresist composition of claim [7 or] 8 wherein the additional heteroalicyclic group has a non-hydrogen ring substituent.
10. (amended) The photoresist composition of claim 1 [any one of claims 1 through 9] wherein the polymer comprises a photoacid-labile group that is a substituent of an additional heteroalicyclic polymer group or a carbon alicyclic polymer group.
11. (amended) The photoresist composition of claim 1 [any one of claims 1 through 10] wherein the polymer comprises a photoacid-labile moiety of a polymer unit separate a carbonate, lactone or carbon alicyclic unit.
12. (amended) The photoresist composition of claim 1 [any one of claims 1 through 11] wherein the polymer comprises a polymerized acrylate that comprises a photoacid-labile moiety.

13. (amended) The photoresist composition of claim 1 [any one of claims 1 through 12] wherein the polymer further comprises anhydride units.

14. (amended) The photoresist composition of claim 1 [any one of claims 1 through 13] wherein the polymer further comprises maleic anhydride units.

15. (amended) The photoresist composition of claim 1 [any one of claims 1 through 14] wherein the polymer is a terpolymer.

16. The photoresist composition of claim 1 [any one of claims 1 through 14] wherein the polymer is a tetrapolymer or a pentapolymer.

17. (amended) The photoresist composition of claim 1 [any one of claims 1 through 16] wherein the polymer is substantially free of aromatic groups.

18. (amended) The photoresist composition of claim 1 [any one of claims 1 through 17] wherein the photoactive component comprises one or more photoacid generator compounds.

19. (amended) The photoresist composition of claim 1 [any one of claims 1 through 18] wherein the photoresist is a chemically-amplified positive-acting resist.

20. (amended) A method of forming a positive photoresist relief image, comprising:

- (a) applying a coating layer of a photoresist of claim 1 [any one of claims 1 through 19] on a substrate; and
- (b) exposing and developing the photoresist layer to yield a relief image.

24. (amended) An article of manufacture comprising a microelectronic wafer substrate or flat panel display substrate having coated thereon a layer of the photoresist composition of claim 1 [any one of claims 1 through 19].